WHAT IS CLAIMED IS:

1.   A variable power link, comprising:

a link circuit to process data having multiple different data transmission characteristics, the link circuit being configurable to operate in multiple power modes, wherein at least two of the multiple power modes are associated with respective data transmission characteristics; and

a local controller to receive activity assignments for the variable power link, wherein the activity assignments are related to data transmission characteristics, and to configure the link circuit to operate in one of the multiple power modes in respective response to a received activity assignment.

2.   The local link of claim 1, further comprising a global controller to determine the activity assignment for the variable power link based upon a routing table, the activity assignment being related to a transmission frequency for the data transmission.

3.   The local link of claim 1, wherein the variable power link comprises a receiver core, the link circuit being a clock and data recovery loop, wherein an ability of the clock and data recovery loop to track changes in a phase of the data transmission is related to the multiple power modes of the clock and data recovery loop.

4.   The local link of claim 1, wherein the variable power link comprises a transmitter core, the link circuit being a serialization circuit that is configurable to adjust a frequency of the data transmission.

5.   The local link of claim 1, wherein the variable power link comprises circuitry that is configurable to adjust amplification of the data transmission.

6.   The local link of claim 1, wherein the link circuit comprises a gain and equalization circuit being configurable to reduce distortion and to compensate for attenuation based upon a medium associated with the channel.

7.   The local link of claim 6, wherein the activity assignment indicates a length associated with the medium.

8.   The local link of claim 6, wherein the activity assignment reconfigures the link circuit for a change between fiber optic and copper media for the channel.

9.   The local link of claim 6, wherein the activity assignment reconfigures the link circuit for a change between long and short media for the channel.

5   10.   The local link of claim 1, wherein the local controller comprises interpretation logic to select the link circuit and to determine the power mode for the link circuit based upon the activity assignment.

11.   The local link of claim 10, wherein the interpretation logic comprises a table to associate the power mode with a data frequency, wherein the activity assignment indicates the data

10   frequency.

11.   An apparatus, comprising:

a port utilization manager to track an availability of a port;

forwarding logic to associate the port with a destination; and

a global controller coupled with the forwarding logic to determine an activity for a link

5   based upon an association between the link and the port and the availability of the
port, the activity being related to a data transmission characteristic for data to
transmit via a channel of the link, and to transmit a control signal to a local
controller, wherein the control signal indicates a power mode for circuitry
associated with the link and the data is associated with the destination.

10   12.   The apparatus of claim 11, further comprising a local controller, responsive to the control
signal, to configure the circuitry associated with the link to operate in the power mode,
wherein selection of the power mode is based upon the activity.

13.   The apparatus of claim 12, wherein the local controller comprises part of a receiver and is
designed to adjust power consumption by the link by selecting the power mode based

15   upon the activity, wherein the power mode maintains data throughput.

14.   The apparatus of claim 12, wherein the local controller comprises part of a transmitter,
the transmitter being adapted to deactivate a gain and equalization stage based upon the
activity.

15.   The apparatus of claim 12, wherein the local controller is adapted to change an operating

20   frequency and an operating voltage for the circuitry based upon the power mode.

16.   The apparatus of claim 11, wherein the global controller is designed to communicate a
routing decision of router for a port of the link to the local controller, wherein the routing
decision determines a data frequency, a traffic type, and a medium type for transmission
of the data, to adjust power consumption by the circuitry according to the activity.

17.   A method for reducing power consumption by a link, the method comprising:

determining an activity for the link based upon forwarding logic, the activity being related to a characteristic for a data transmission via a channel of the link;

associating the activity with a power mode for the link, wherein the power mode is related to the characteristic; and

configuring circuitry associated with the link to operate in the power mode to process the data transmission.

18.   The method of claim 17, wherein determining comprises selecting a medium for the channel.

19.   The method of claim 17, wherein determining comprises determining that the link is inactive.

20.   The method of claim 17, wherein associating comprises associating the transmission frequency with a configuration of the circuitry.

21.   The method of claim 17, wherein configuring comprises substituting a clock and data recovery loop with a less complex, clock and data recovery loop associated with a lower power consumption.

22.   The method of claim 17, wherein configuring comprises reducing a bias of a gain circuit.

23.   The method of claim 17, wherein configuring comprises reducing a frequency of a serialization circuit.